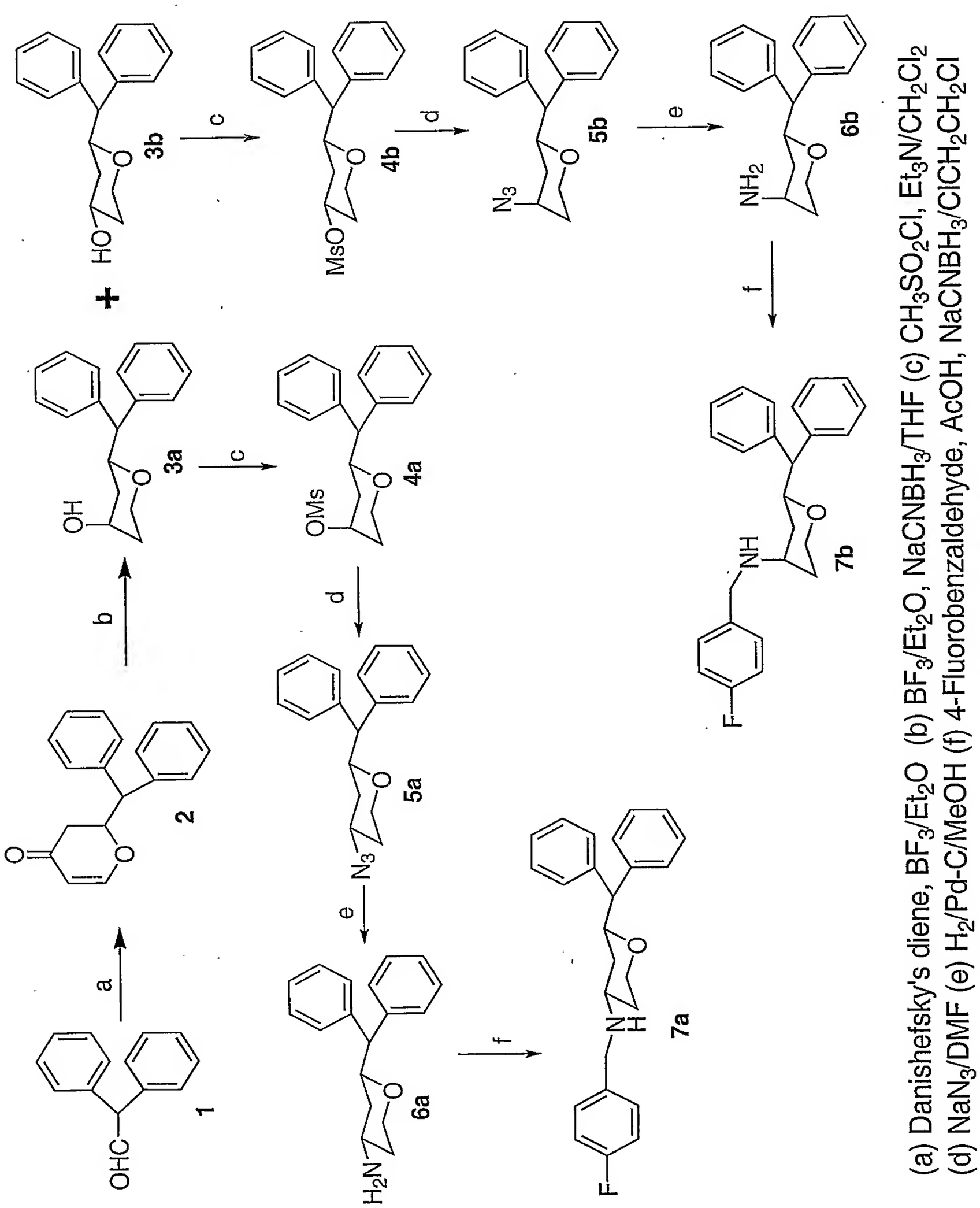
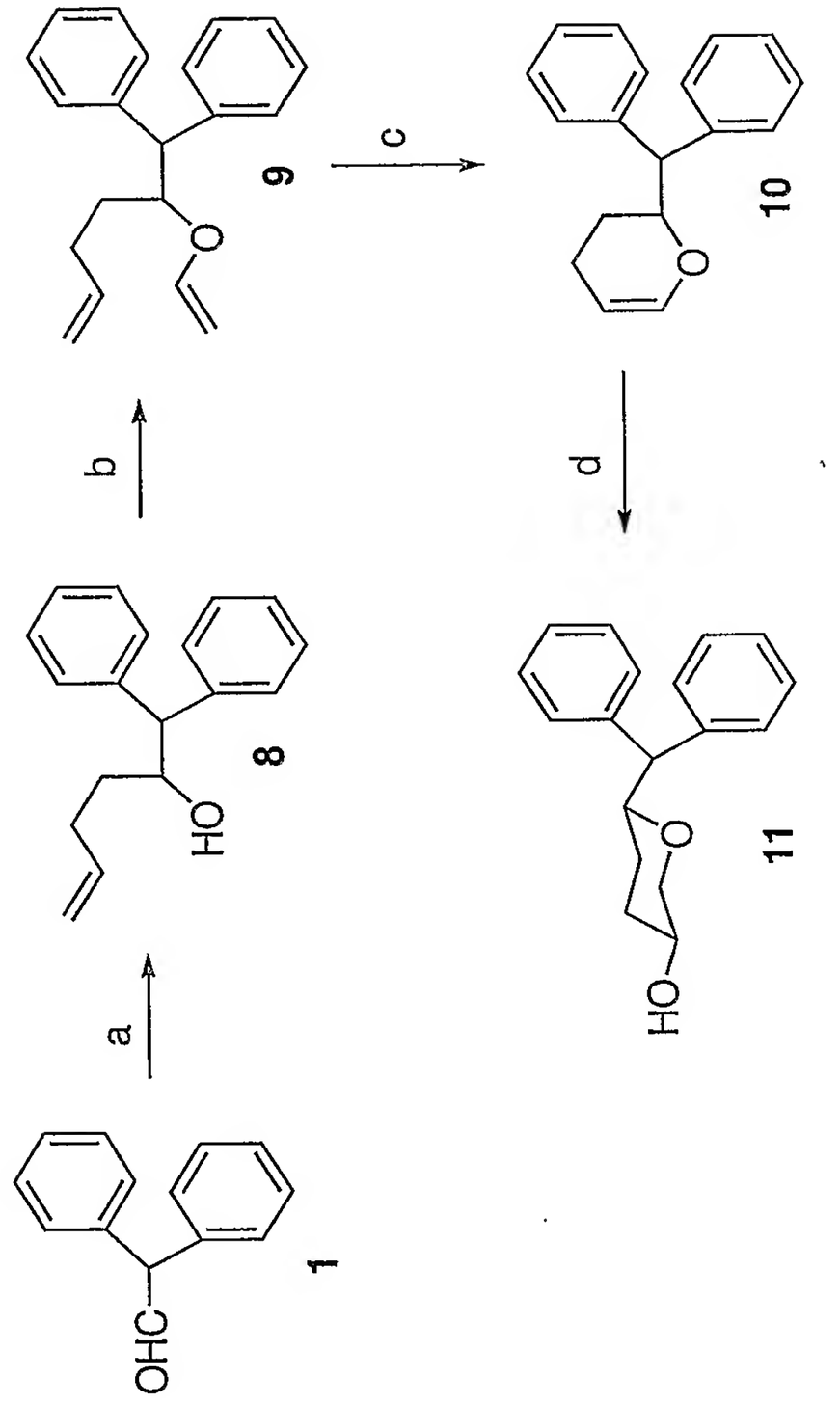
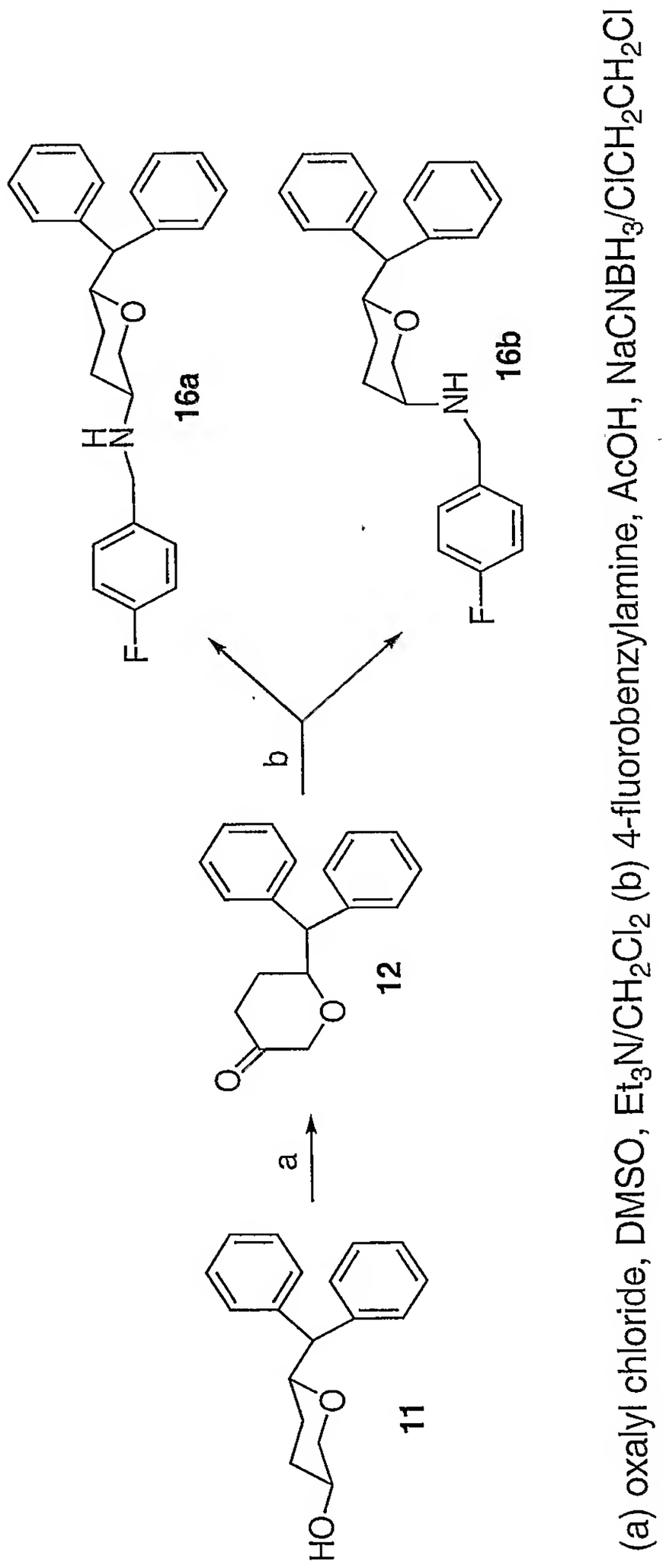

3b
4b
5b
6b
HO
MsO
N3
NH2
3a
4a
5a
6a
7a
7b
1
2
OHC
OH
OMs
H2N
NH
F
O
a
b
c
d
e
f
(a) Danishefsky's diene, BF3/Et2O (b) BF3/Et2O, NaCNBH3/THF (c) CH3SO2Cl, Et3N/CH2Cl2
(d) NaN3/DMF (e) H2/Pd-C/MeOH (f) 4-Fluorobenzaldehyde, AcOH, NaCNBH3/ClCH2CH2Cl

Figure 1



(a) 4-bromo-1-butene, Mg, Et_2O (b) Ethyl vinyl ether, $Hg(OCOCF_3)_2$
(c) Grubb's catalyst, Benzene (d) 9-BBN/THF, NaOH, H_2O_2

Figure 2



(a) oxalyl chloride, DMSO, Et_3N/CH_2Cl_2 (b) 4-fluorobenzylamine, AcOH, $NaCNBH_3/ClCH_2CH_2Cl$

Figure 3

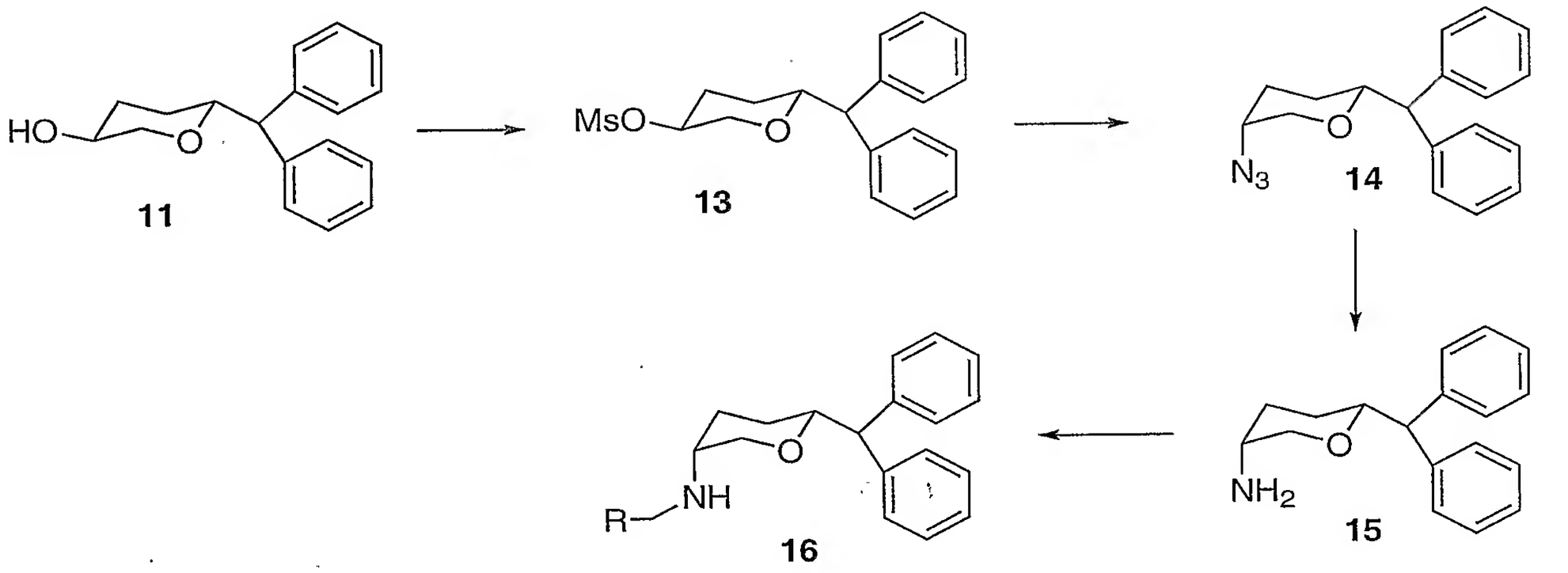

HO
11
MsO
13
N3
14
NH2
15
NH
R
16
16c R= CN
16d R= NO2
16e R= OCH3
16f R=
16g R=
16h R= OH
16i R= Cl Cl
16j R= F F
16k R=
16l R= Br
16m R= I
16n R=

Figure 4

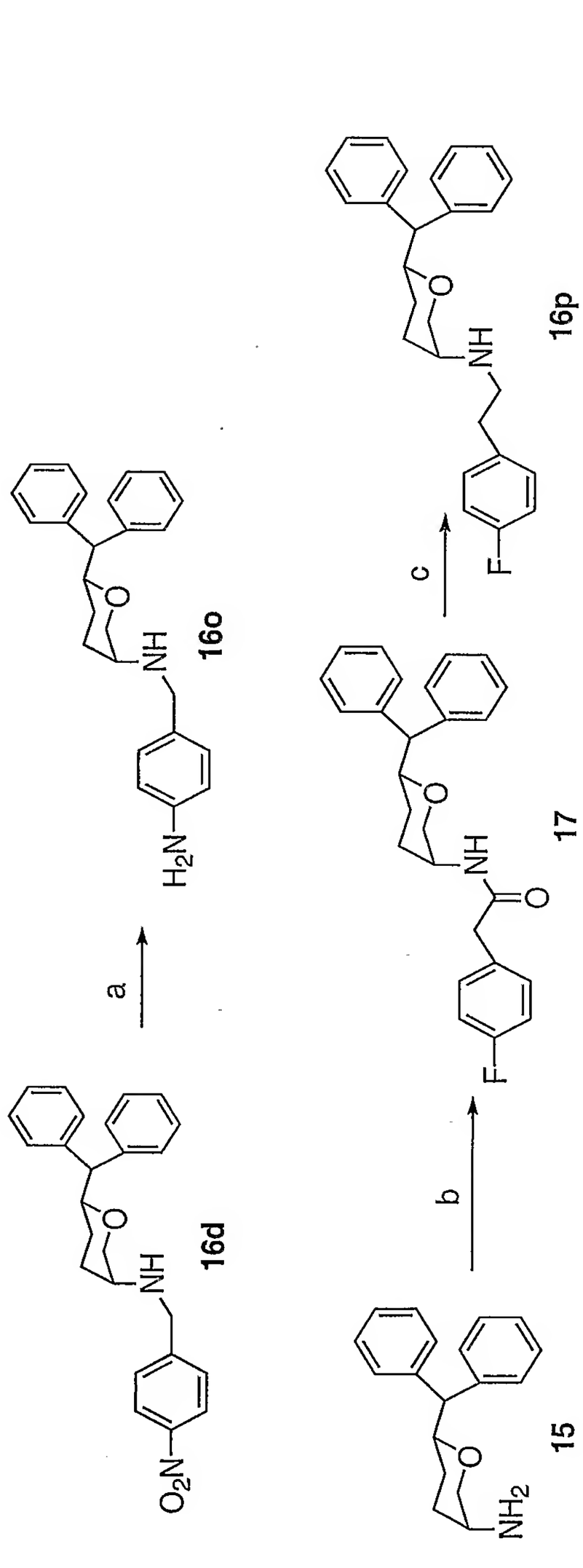

(a) $SnCl_2 \cdot 2H_2O$/EtOH/EtOAc (b) 4-fluorophenylacetyl chloride, Et_3N/CH_2Cl_2 (d) $NaBH_4$, $BF_3 \cdot Et_2O$/THF
a
b
c
15
16d
16o
16p
17

Figure 5

Scheme 1

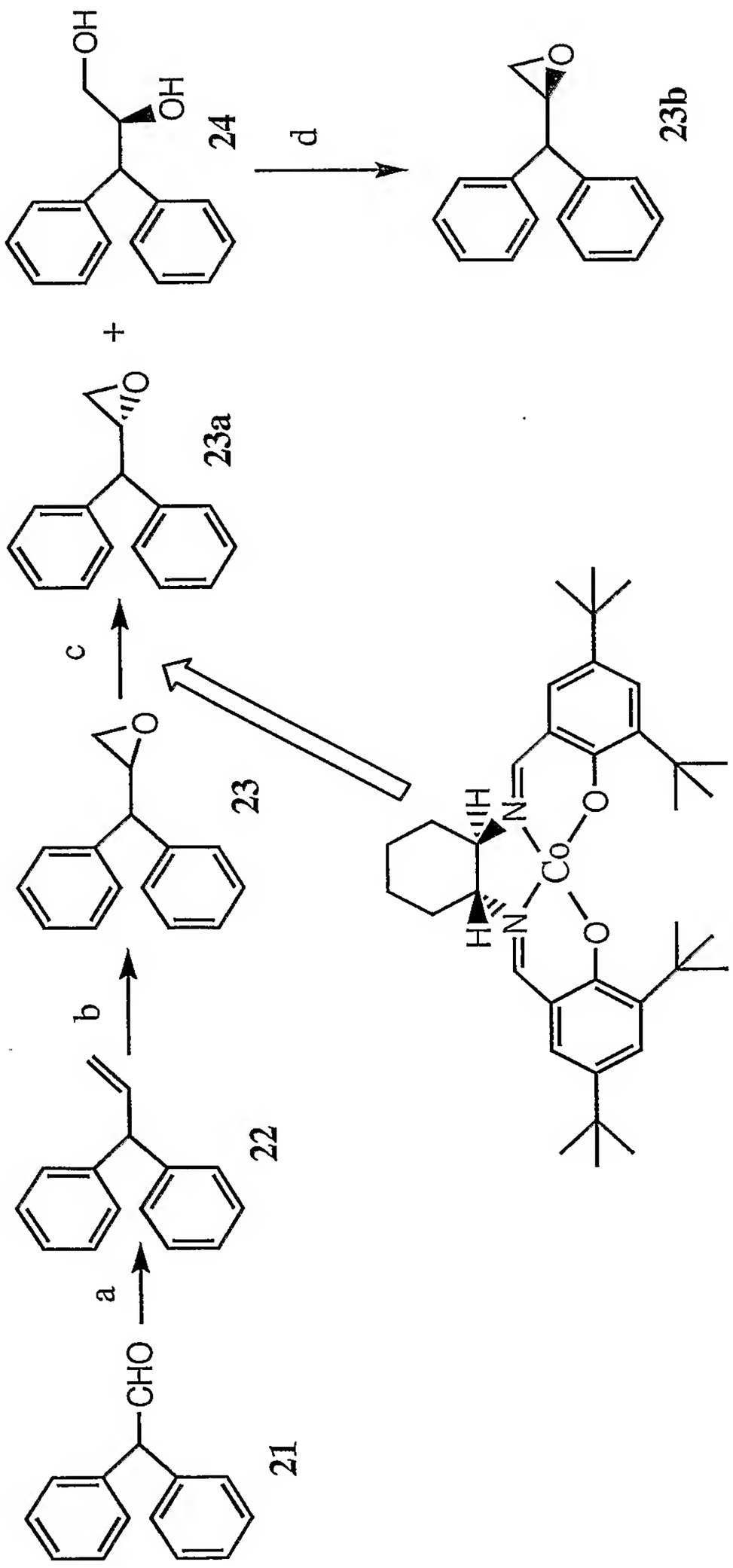
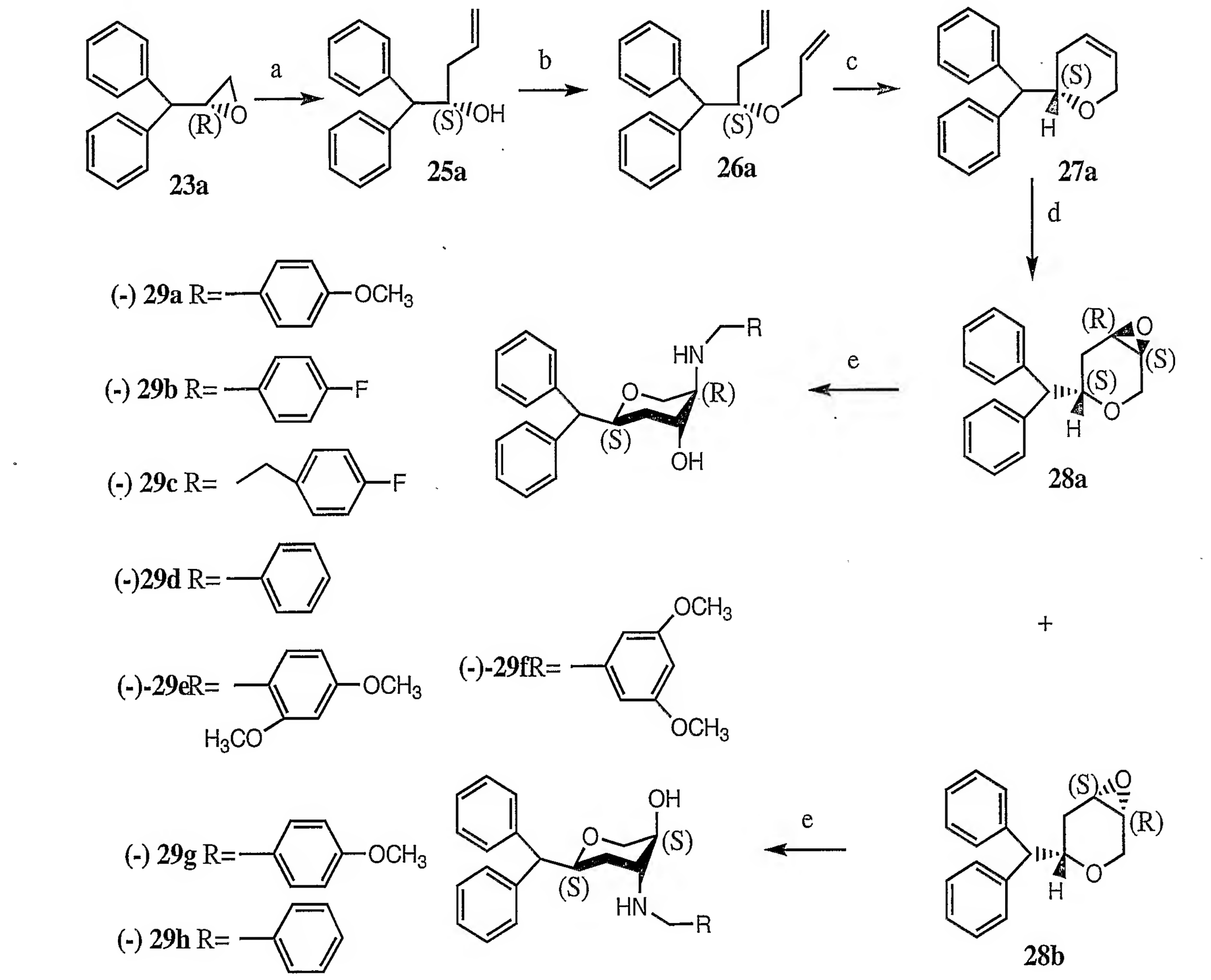


Figure 6

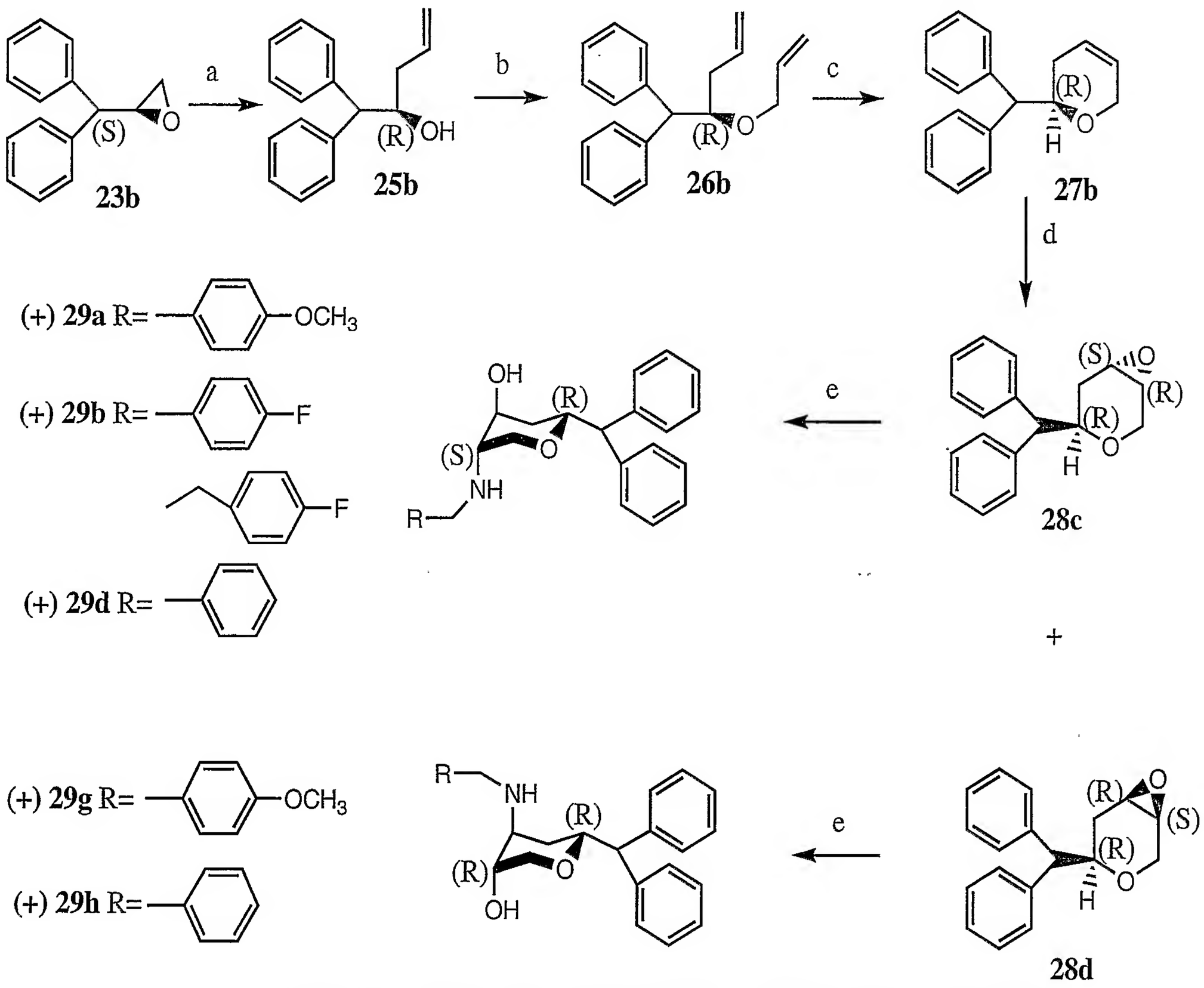
Scheme 2



a) vinyl magnesium bromide/CuI/THF b) NaH/allyl bromide/DMF c) Grubbs' catalyst/benzene d) mCPBA/CH_2Cl_2 e) amine/ethanol

Figure 7

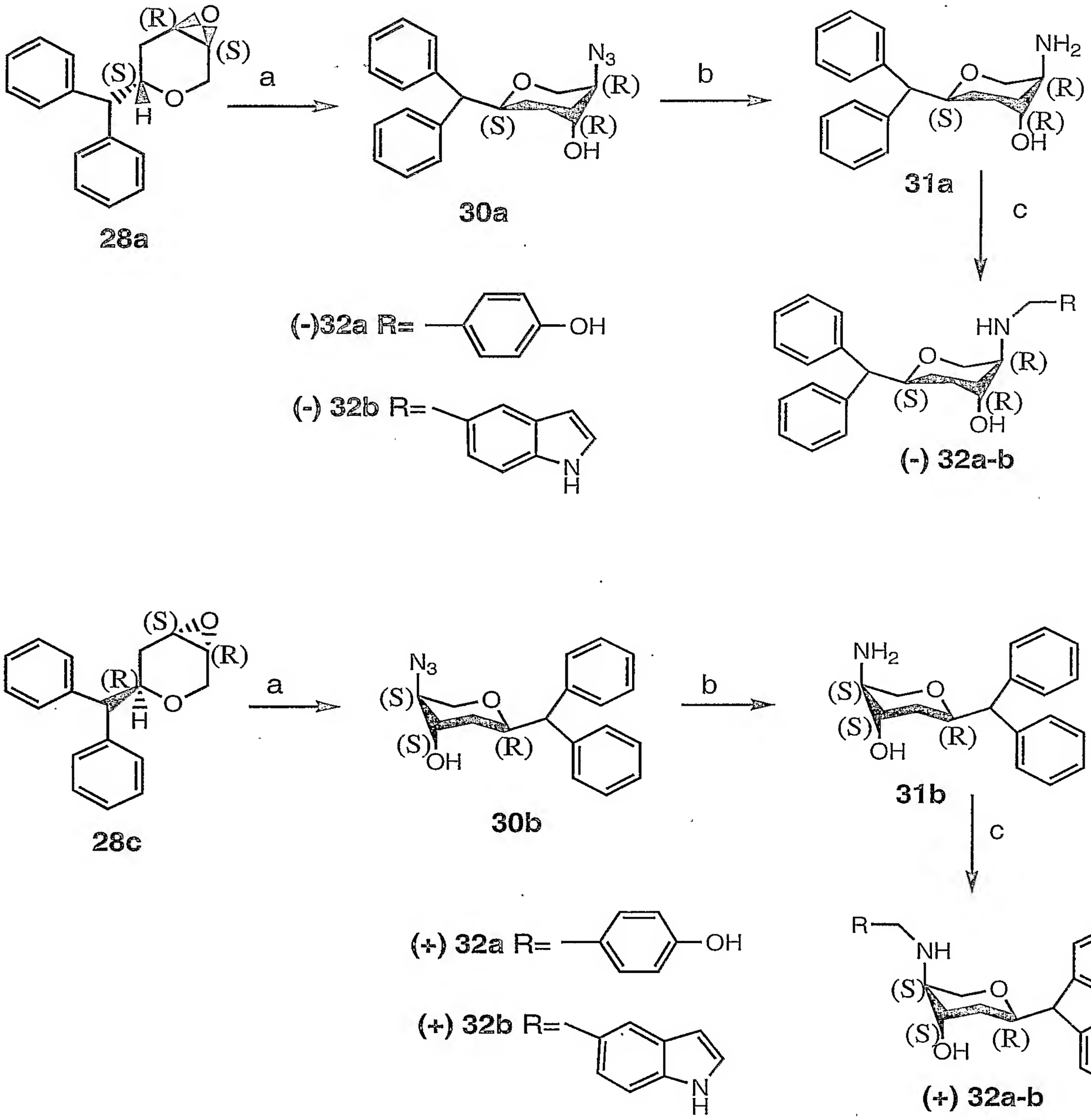
Scheme 3



a) vinyl magnesium bromide/CuI/THF b) NaH/allyl bromide/DMF c) Grubbs' catalyst/benzene d) mCPBA/CH_2Cl_2 e) amine/ethanol

Figure 8

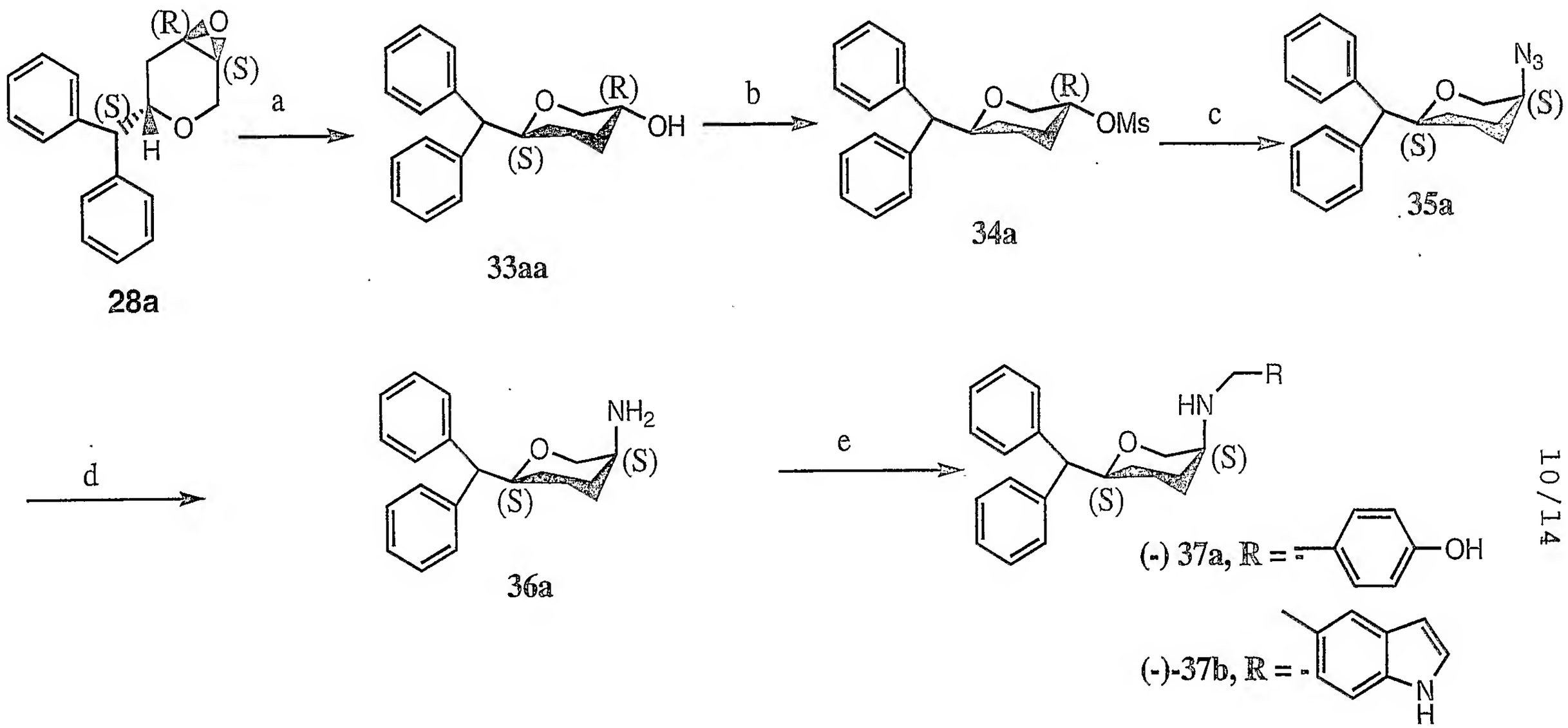
Scheme 4



a) $NaN_3/NH_4Cl/THF\text{-}H_2O$ (8:1), 80°C, overnight. b) H_2/Pd-C, MeOH, 4 hr. c) aldehyde/AcOH/$NaCNBH_3$, $ClCH_2CH_2Cl$, room temperature, 4 hr

Figure 9

Scheme 5



28a

33aa

34a

35a

36a

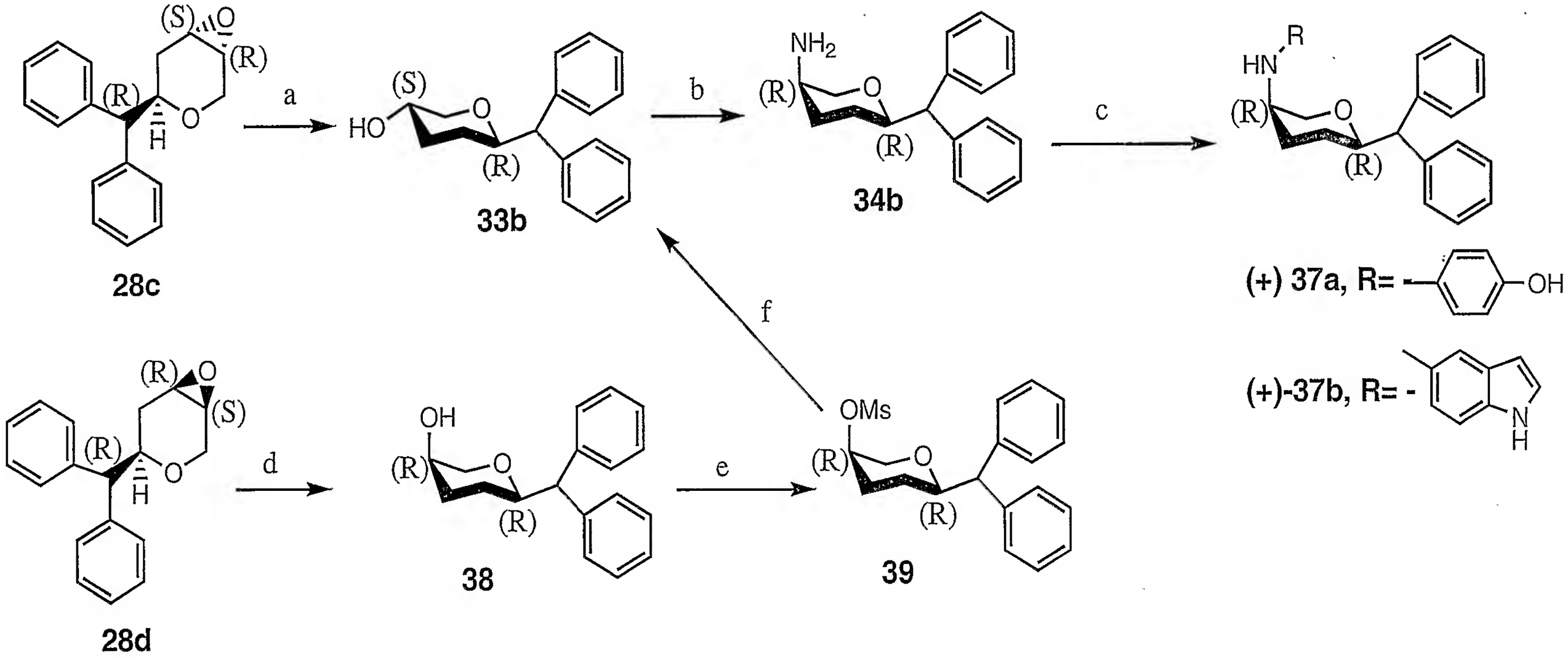
(-) 37a, R = -

(-)-37b, R = -

a) $LiAlH_4$/dry pentane, room temperature, 20 h b) $MeSO_2Cl/Et_3N/CH_2Cl_2$, room temperature, overnight c) NaN_3/DMF, 100°C, overnight d) H_2/Pd-C, MeOH, 4 h e) Aldehyde/AcOH/$NaCNBH_3$, 4 h

Figure 10

Scheme 6



a) $LiAlH_4$/pentane, rt, 20h b) i. $MeSO_2Cl/Et_3N/CH_2Cl_2$, rt, overnight ii. NaN_3/DMF, 100°C, overnight iii. H_2/Pd-C

c) Aldehyde/AcOH/$NaCNBH_3$; d) $LiAlH_4$/12-crown-4/pentane, rt, 15h

e) $MeSO_2Cl/Et_3N/CH_2Cl_2$, rt, 4 h f) KO_2/18-crown-6/DMSO-DMF (iii) HCl/H_2O

Figure 11

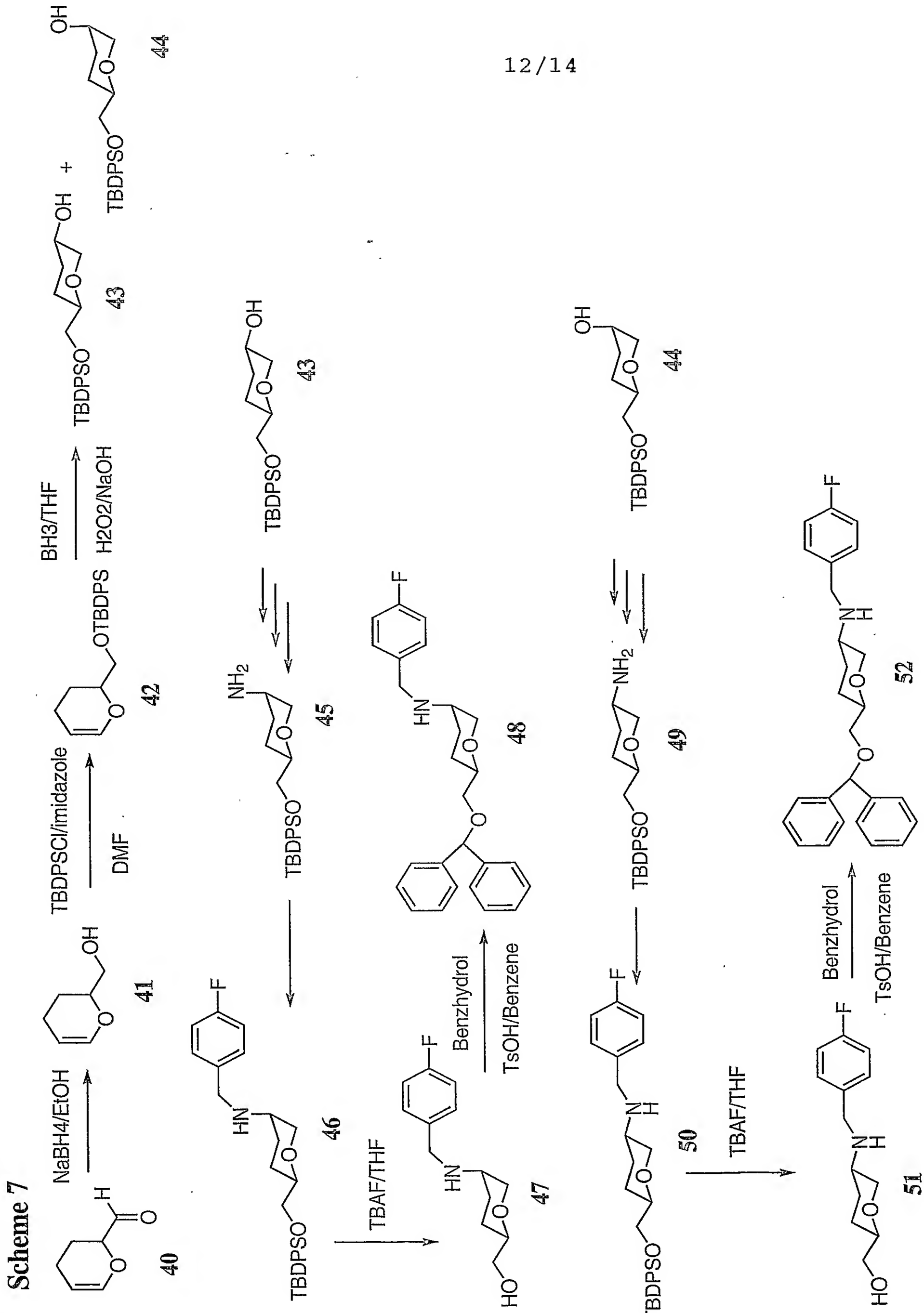
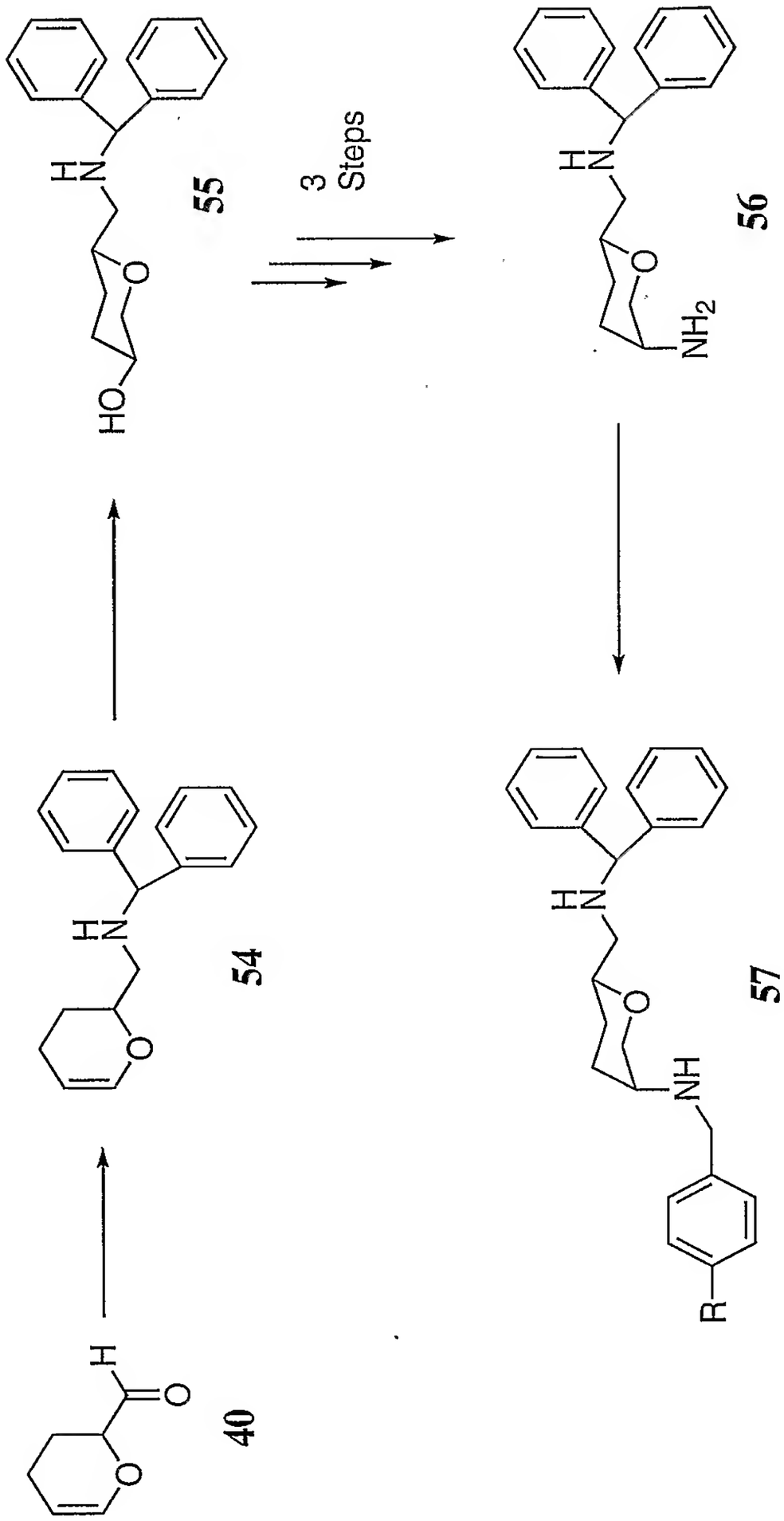
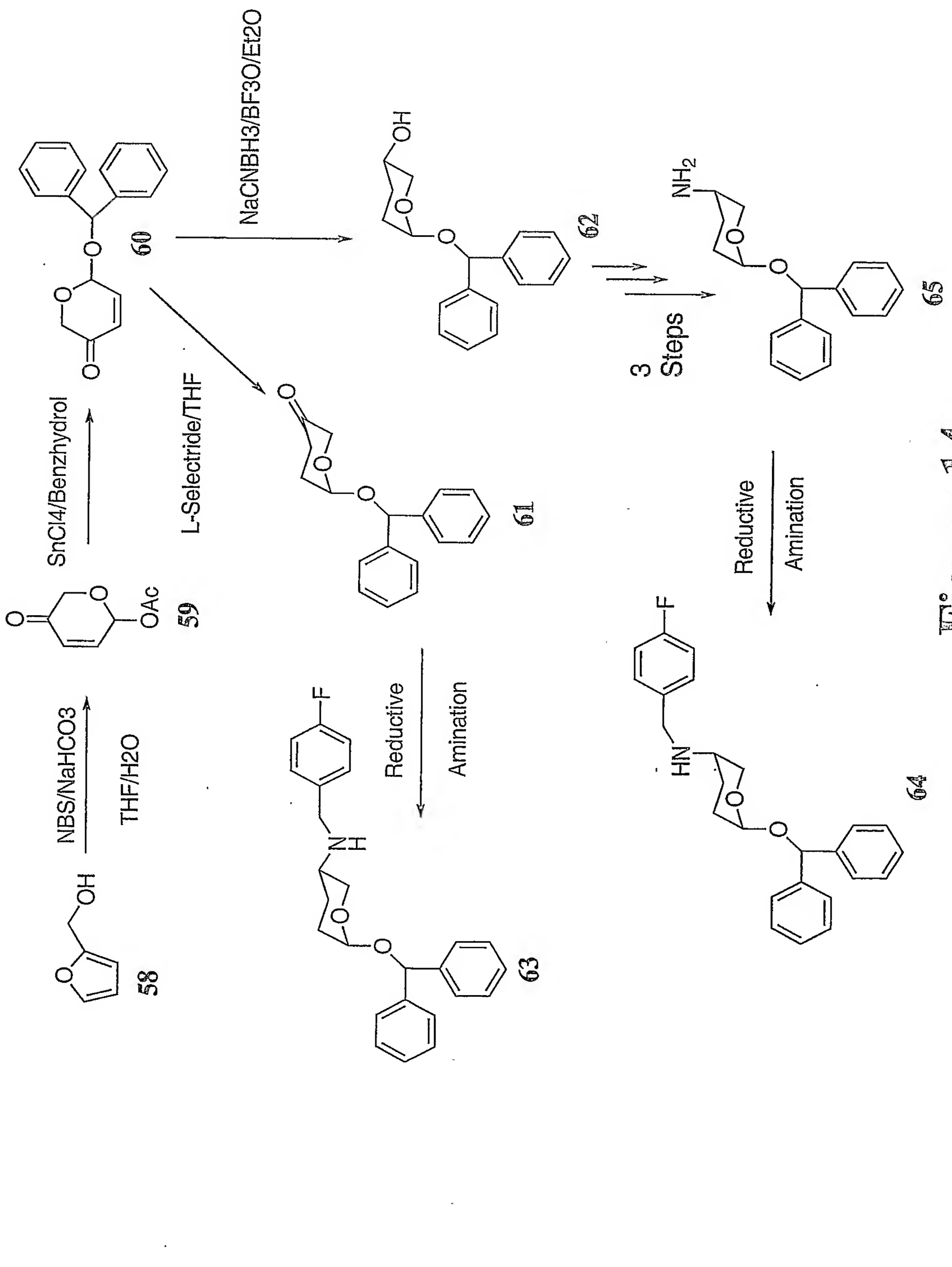

Scheme 7
NaBH4/EtOH
TBDPSCl/imidazole
DMF
BH3/THF
H2O2/NaOH
TBAF/THF
Benzhydrol
TsOH/Benzene
TBAF/THF
Benzhydrol
TsOH/Benzene
40
41
42
43
44
45
46
47
48
49
50
51
52
TBDPSO
OTBDPS
HO
HN
NH2
F

Figure 12



Scheme 8

Figure 13


SnCl4/Benzhydrol
OAc
59
60
NaCNBH3/BF3/Et2O
OH
62
L-Selectride/THF
61
3 Steps
NH2
65
Reductive Amination
F
NBS/NaHCO3
THF/H2O
OH
58
NH
63
Reductive Amination
F
HN
64

Scheme 9